

Field Stations

JR-1978-1979 1980-
1981

7530-00-222-3521

FEDERAL SUPPLY SERVICE

(GPO)

.87

J. ROSEWATER

Smithsonian

Institution

Will Film

ezon

Field Station, Oregon
Dept Invert Zool. - Mexico

Date _____

Field No. _____

Time _____

Sta No. _____

Coll by _____

Lat Long _____

Chart _____

Locality _____

Ecol. Habitat _____

Vegetation _____

Bottom _____

Type Shore _____

Type Shore _____

Dist. shore _____

Water Temp _____

Salinity _____

Turbidity _____

Current _____

Tide _____

Depth water _____

Depth capture _____

Method capture _____

Preserve live _____

Photographs _____

General notes _____

Field Data Record
Dept Invert Zool

Date _____

Field No. _____

Time _____

Sta No. _____

Coll by _____

Lat Long _____

Chart _____

Locality _____

Ecol. Habitat _____

Vegetation _____

Bottom _____

Type Shore _____

Type Shore _____

Water Temp _____

Turbidity _____

Tide _____

Depth capture _____

Observer _____

Photograph _____

Current Note _____

Dist. shore _____

Salinity _____

Current _____

Depth water _____

Method capture _____



Trip To Washington, Oregon
California and Mexico

June 1978 - M & J Rosewater
(arrived at 11:40 AM.)

IR-1-78 - June 11, 1978 - 1:00 PM
(Low tide 0.8 ft. at 1:16) Cobble
Beach - mostly small ^{smooth} stones - few large
boulders. Lincoln Park, Seattle, WA.
Littorina scutulata and L. sitchana
on and under cobbles evenly distributed
over beach. Gently sloping shore -
even gradient, uncovered by low tide.
Film Photos taken here, at Alki pt. (no
Littorina), on Ferry betw. Seattle &
Winslow and at Port Townsend thru #30
Ecology of these two Littorinas differs
markedly from New England species which
appear more limited to specific areas rather
than being distributed evenly over shore.

June 12, 1978 JR-2-78

8:00 A.M. Port Townsend, WA, $\frac{1}{2}$ mi. S.
of town opposite Port Townsend Motel, off of
State Route 20, at Mouth of Puget Sound
where it flows into Str. of Juan de Fuca.

High Tide at 7:14 A.M. - Tide dropping. Littorina
scutulata + L. sitchana on and under cobbles
and boulders and sea weeds - light colored sitchana
and larger sized seem to be appearing as
water dropped. Collected from about 7:30 -

8:30 A.M. Water temp 14°C , Salinity 27‰
Film #1, frames 31, 32 shore with wharf +
deck + gulls, + semi vertical view of beach
with cobbles + boulders.

#33 View of Floumountain in Olympic range
from Sequim, WA. + 34

June 12, 1978

JR-3-78

12:30 P.M. Sekiu, WA. on Strait
of Juan De Fuca, about 18 mi
E.S.E. of Neah Bay. Littorina sitchoua
& some L. scutellata from breakwater
rocks - shells on seaweed (sitchoua
on "Fucus" (?) (like hirtelluseta) larger
in size than seen before. Low tide
was about 11:15 A.M. Temp. ca 18°C,
Salinity 28‰, Kodachrome film #35

June 12, 1978

JR-4-78

1:30 P.M. about 4-5 miles west
of Sekiu, WA - Point with large
boulders - moderate low Tide - filling
large Littorina sitchoua on rocks - in
mid intertidal - Kodachrome - roll 1,
Nos 36-37 taken of pillar & Vancouver
across strait with Mary in both.

June 12, 1978

JR-5-78

2:45 P.M. Neah Bay, WA. - Rock shore
west side, Littorina from "Fucus" Salinity 26‰
Temp. 18°C - Kodachrome Roll 2 - 1-15 ?
Freshwater stream entering at head of bay. or less?

June 13 Kodachrome Roll 2 - frames 16 - 18⁺
between Ruby Beach + Kalalook, Olympic
National Park, Pacific coast area. - Beach,
surf, timber, road with regrowth after
burn.

June 13, 1978 JR-6-78

Rock-Revetment + Groin Point Chehalis,
Westport, WA, 10:30 AM. (low tide
at about 12:00 N. Littorina scutulata
(only) from rocks among barnacles
+ algae R2 - fr. 19-21 of site +
sign

June 13, 1978 JR-7-78

Salt (Salicornia) Marsh - $\frac{1}{4}$ mile west
of Elk R Bridge. Few "Alexia"
at bases of plants in mud. No
Littorina - Kodachrome # 22 taken
of Marsh with Westport in
far distance. Salinity 16 ‰
Temp. 20°C 12 Noon - 1230

June 13, 1978

JR-8-78

AT EIK R Bridge (inside) Route
105 near Westport, WA. from edge
of tidal River channel, Salicornia
marsh, with "Fucus" at margin near
tidal channel. Littorina + eggs
found on + under "Fucus" + on
mud beneath. Salinity 16‰. Littorina
may be lowered salinity form of
L. sitchana? 1230 pm - 1:30 pm
Kobachrome # 23, 24, 25 - views
of bridge + salicornia/fucus flat

June 13, 1978

JR-9-78

about 6 mi N.E. of Ilwaco on
Willapa Bay. off Route 101.
Littorina associated with "Fucus" -
living on + eggs on, attached
to stones at margin of bay.
Photo # 26 of stony beach.

Kobachrome, 27, 28 - View of ^{ocean} Coast from
High Point State Pk (?) looking down
on Manzanita + Rubus, 0

June 14, 1978 - #29 View from Cape Meares St
Pk - High Pt. c. tide

number circles = negative
collection station

June 14, 1978

JR - (10) - 78

9:45 AM

Outer side of Tillamook Bay, Oregon
west of Bay City - between T- +
Cape Meares. Rocks, muddy shore
with Fucus patches, sparse foliaceous
No Littorina - foliaceous 1% Tillamook
River influence - at crotch of jetty

June 14, 1978

JR - (11) - 78

9:00 AM

Cape Meares, Oregon - outer coast
limestone beach (can stroke the
cobble - got out) No Littorina.
Gross barnacles + Bythotrephes
or Physalis about 2" (purple) -
pearl on beach.

June 14, 1978

JR - 12 - 78

10:15 AM

Outer side of Tillamook Bay, Oregon
near JR-10, 1978 - about 1/2
mile out on jetty - rocks, boulders
with Fucus - L. setchellii eggs
(low water zone) fairly big. abundant
No Littorina - foliaceous 0%!?
few blue murex, no gulls, black Nereis

Kodak 35 - 31 Tillamook

1000 murex, Littorina (from with collecting area in
Tillamook Bay)

June 14 1978

TR-13-78

Netarts

Netarts, Oregon at Bay - ^{shore} side
Rocky fill shore - *Littorina scutulata*
on & under rocks - sample taken
Salinity 15‰ Temp 15°C [large
spec. inhibited by hermit crab - smaller
spec. are alive!]

June 14, 1978

Photo #1 frame 32, 33 - from
Anderson point - North showing
Netarts Bay & the ocean coast looking
up toward Cape Meares & showing
"3 arch Rocks" islands - Not a Wildlife
Refuge - home of Steller sea lion.

June 14, 1978

TR-14-78

2:15 P.M.

Siletz Bay (Head) just south
of Lincoln City, Oregon - rocky
promontory just south of River
entering at mouth of Bay, lit. cut,
in sand at low salinity during 4
hr. bell tide with air & under rocks
on tidal flats. low tide was
about 1:00 P.M. Photo frame 34, 35 (roll 2)

June 15, 1978

JR-15-78

Sunset Bay State Park, Cape Arago,
just south of Charleston Oregon 9:30 AM
dropping tide. Littorina from rock
surfaces from mid tide line to
6-8 ft. above high tide line. larger
specimens on higher rocks. Fucus
"Ulva" present. A. sitchana + planaxis
Not seen Tegula, "Murex" ^{em} Ner
crabs etc in pools. Salinity 25‰
P.R. 2 #36

37, 38 Shore areas State Park
(shore → Botanical Garden)
ca 2 miles S of Sta JR-15-78

June 15, 1978

JR-16-78

11:30^{AM} - 12:15 PM

Cape Arago State Park - south
coast Littorina from rocks pools
at & above intertidal - low tide
ca 12:30 PM. - abundant streaked
"By the Wind failies" - Kodachrome #3
Frames 1-10 (11?)

June 15, 1978

JR-17-78

North Jetty, mouth of Coquille R,
Bandon, Oregon - *L. scutellata* +
Thais on rocks. 2:30 P.M.

June 15, 1978

JR-18-78

1-2^{mi} South of Port Orford Oregon - rocky
coast - *L. scutellata* only -
on rocks - Salinity 33.700

Kodach 3 frame 12 Rogue River
Bridge, Gold Beach, Oregon.

Kodach 3 frame 13 -

below Cape Sebastian St. Park
near Pistol River

↓ Frame 14 Crescent City, CA.
light house #15

June 15, 1978

JR-19-78

Crescent City, CA near light house Pt.
Littorina scutellata from rocks
on rising tide don't go farther
N. on beach - Salinity 33.700

Kodach rows 16, 17, 18 : of sunset
over rocky, pineapple islands

June 16, 1978

JR-20-78

9:15 AM

about 15 mi S of Graceland City, CA
on US 101 - *Littorina scutulata* only
on rocks -

near Lagoon Creek

June 16, 1978

JR-21-78

10:30 AM

County Park, 1 mi SW of Orick on
Route 101 - *L. scutulata* only
on large rocks at end of
beach (locality across from
Freshwater Lagoon).

June 16, 1978

JR-22-78

11:45 AM

Ocean Beach, Trinidadth State Park -
L. scutulata + from rocks & seaweed.

June 16, 1978

JR-23-78

12:15 PM

Trinidad, CA State Park - Bay
side of point *L. scutulata* only
from rocks?

June 16 1978

IR-24-78

245 - 415 pm

about 1 mi. N. Sausalito, CA on West side
of Humboldt Bay, along marsh fringe
& mud interface - marshgrass hummocks
about 1-2' above mud at low tide.

L. newcombiana associated with
Atriplex & some *L. scutellata* at
base of *Salicornia* & under ferns
on damp mud. - Salinity 25‰

Kodachrome 3 from 24-25 of
beddy, biddy, polluter
24, 25 of sign & sandbar

June 17 1978 -

26 27 28 Kodachrome

Avenue of Giants sign

29-30-31

Mary & Redwood

32 - Pine tree lot

33-34 Mendocino Valley State

dry grass & green trees & grove of
small trees

June 17, 1978

IR-25-1978

ca 4 - North of Bolinas Bay, CA.

5/12

L. scutellata only on rocks

June 17, 1976

JR-26-78

About 15 mi N of San Luis Obispo, CA
on inlet along CA 52nd 1.
L. scutulata only on & under
small stones & cobbles.

June 18, 1976

JR-27-78

San Francisco Bay about 1 mi
N of Sausalito Point along side ^{US} Rt 101
- 10:30 AM - ebbing tide - *L. scutulata*
on ^{under} rocks along water line (looked
down at bottom to no avail)
Salinity 25 ‰ -

June 18, 1978

JR-28-78

Fort Point San Francisco, CA, below
Golden Gate Bridge - *L. scutulata*
Some rocks exposed - high energy
beach Salinity 30 ‰ in 500m
Kobach Ball 4 1-4 of all size
& bridge.

June 19, 1978

JR-29-78

Naval Base on

Treasure Id, San Francisco Bay,
under Bay Bridge, West side

of Island - on algae covered
rocks, *H. scutellata* - Thais sp.
(high energy coast) - on Naval Base
8:30 A.M. - mid tide

rising

June 19, 1978

JR-30-78

Naval Base on

~~Island~~ Treasure Id, San Francisco
Bay, East side of Island on

Algae covered rocks (*Fucus* +)
under rocks - *scutellata* side
solitary 26°/100 9:00 AM -

rising - mid tide - *scutellata* - at & just below

tide line & semi dry - usually
under rocks on *Fucus*.

June 19, 1978

JR-31-78

12:00 Noon

Moss Landing, CA. at entrance
to Harbor (S. side) on Rock Jetty.
both *A. scutellata* & *A. planaxis* (first
sighting) on damp sides of boulders
just at top of tide line (spray
zone) *A. planaxis* (almost) all were
apparently copulating (pairs of 1 lg.
& 1 smaller individual) - note that
color of *A. planaxis* is a
delicate "salmon pink" color that
fades rapidly. Salinity 36‰ !
Tide falling, low at about 2:30 PM.
Kodachrome Roll 4 - #5-12

June 19, 1978

Kodachrome #4 - #13+14 - Moss
Landing Marine Lab & bluest
Marine Power Plant

Kodachrome 4 - #15-16

Pt. Pinos - ground vegetation &
steep point - Pacific Grove
Cal.

#17 - Soft Cove - Lighthouse

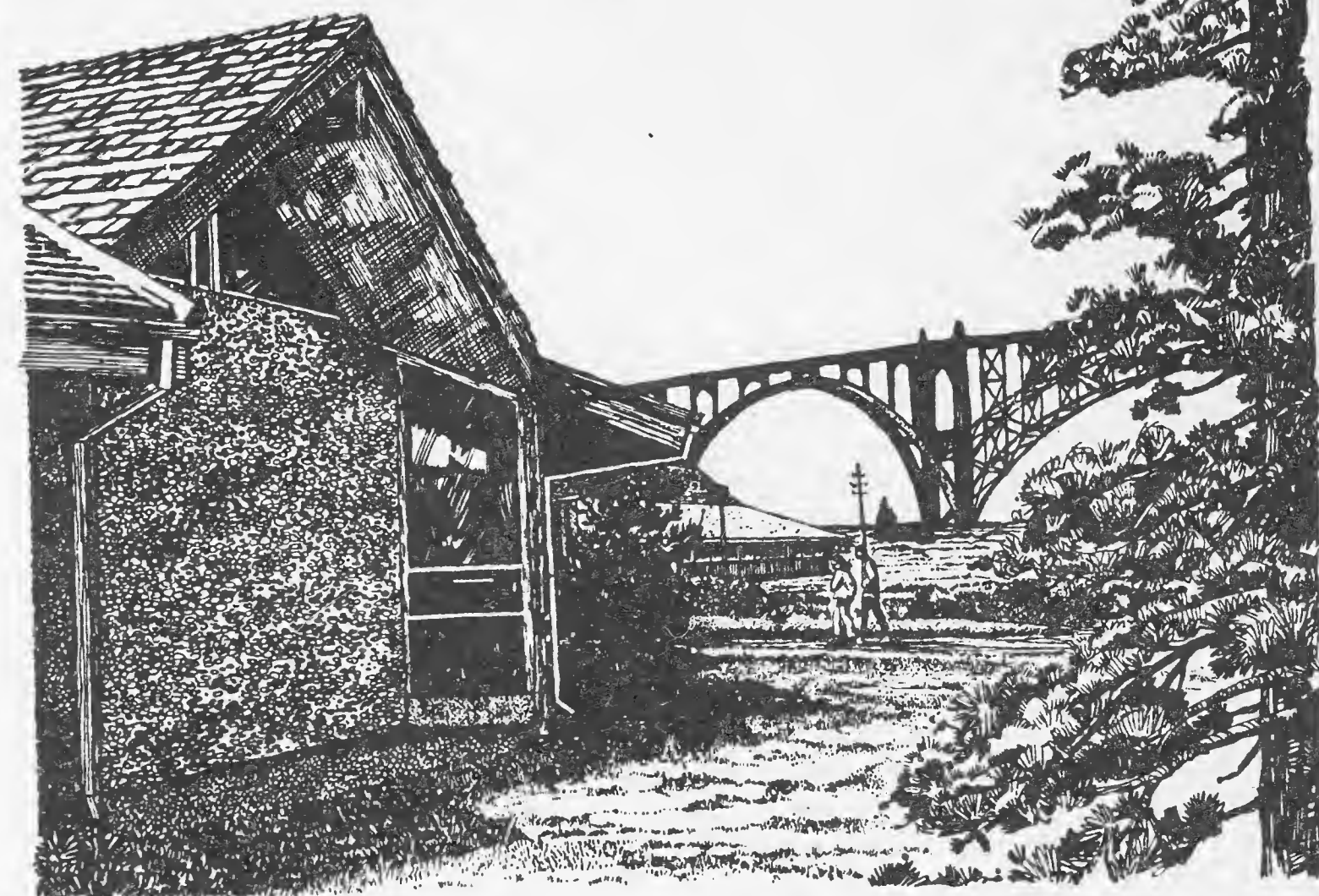
#18 - Coast from same spot

road at Pt. Pinos

P.G.

MARINE SCIENCE CENTER

ON YAQUINA BAY



The Marine Science Center in Newport is the hub of Oregon State University's coastal research, teaching, and marine extension activities. It serves the general public and state and federal agencies, as well as the university. The Center was built in 1965 with the help of the Port of Newport, which provided the land, and the federal government, which granted initial construction funds.

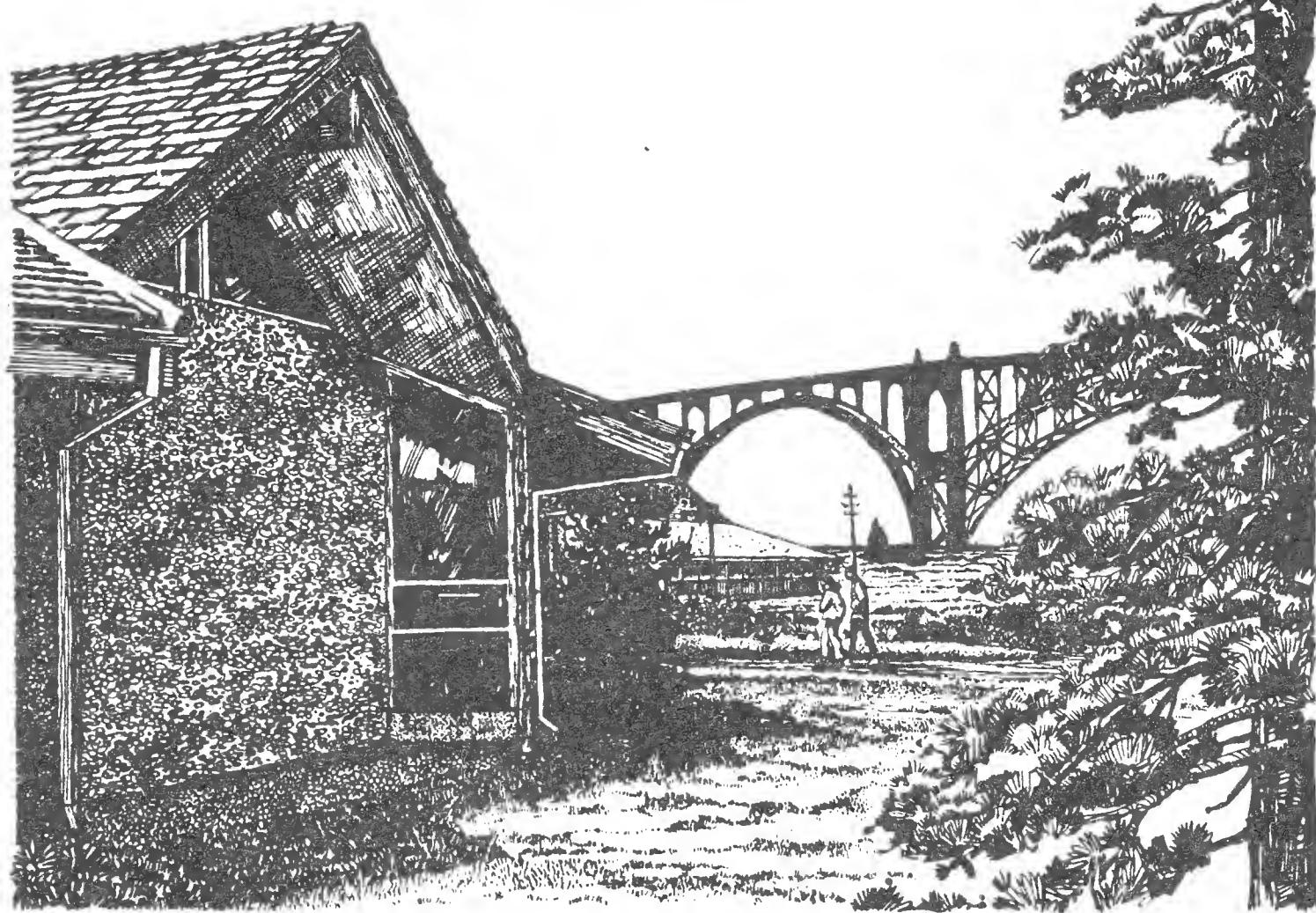
PUBLIC MUSEUM-AQUARIUM

Museum panels and aquaria are windows to the ocean world for more than a quarter million visitors each year. Museum displays explain properties of the oceans, and aquaria exhibit specimens of Oregon's marine fishes and invertebrates. Special educational programs are offered to schools and other organized groups. The public area is open daily 10-4, and 10-6 during the summer.

OREGON STATE UNIVERSITY'S

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ON YAQUINA BAY



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RESEARCH LABORATORIES

The Center's main building houses marine-related research projects of several university groups and of the U.S. Environmental Protection Agency. Some scientists study physical and biological phenomena of the Pacific Ocean and its estuaries, while others investigate pollution problems and how they affect marine life. Many of the staff work on methods to increase the wise use of our marine resources; they are studying fish and shellfish aquaculture, and developing improved fishing gear. Research programs are sponsored by federal, state and private agencies.

The Oregon Department of Fish and Wildlife has a separate building to the west of main building; research programs concern management of the state's marine fishery resources.

The Yaquina Head Station, about five miles north of Newport, is operated by the Center for special educational programs and research projects requiring a beach location.

RESEARCH VESSELS

Newport is the home port for the 180-foot WECOMA, 80-foot CAYUSE, and several smaller vessels of the School of Oceanography. Ship support facilities and the main dock are located at the northwest corner of the Center.

For additional information write:

OSU Marine Science Center
Marine Science Drive
Newport, Oregon 97365

The telephone number is (503) 867-3011.

June 19, 1978

Kodachrome 4 - # 19 - near 100 ft. from
Pacific Grove, Cal. Marine Reserve

June 19, 1978

JR-32-78

Asilomar State Beach, west
of Pacific Grove, CA. Monterey
Peninsula. *L. scutellata* + *L.*
planata on granitic (?) rocks
& boulders. Low tide. *L. scut*
from middle-supper tide area
L. planata in upper tide area
to spray zone above tide line.
Kodachrome taken to show
composition of rock surface (weather
in places may be disruptive to
~~also~~ permit survival on multi-
colored rock. (?) S/m 4 # 20-24

June 20, 1978

Kodachrome 4 # 26, 27, 28, 29
View of Salinas River Valley, Fresno
County - (2 E to 20 1/2 mi)
near Mariposa

Kodach. - 30, 31, 32 - Rest area
near Bradley & Camp Roberts
& hills around it.

June 20, 1978

Kodachrome #33, Mts. hills E. of
Morro Bay
#34 "mt of rocks" at Morro Bay

June 20 1978 JR-33-78

1:00 P.M. ca low tide

Morro Bay, CA. - Rock Jetty S.
of Morro Rock & planaxis &
L. scutellata from on & under
rocks,

JR-33-78-1 from beach
side of Jetty on mid & high
tidal levels

JR-33-78-2 from top &
outside of Jetty in ocean

→ spray zone. (spray heavy)

JR-33-78-3 from low tide

line on rocks, very young

- recently metamorphosed

specimens of both species

✓ Noted large range of
sizes of L. planaxis egg clings
film 4 - frames 36-38 found
here at Morro Rock.

Film #5 #1 "Big Sur" Coast N of Morro
Bay #2 Morro rock from town

#5
Morro Rock from Pale Museum →

June 20 -

Pismo Beach CA
H 6, 7 "Pismo Beach, Clam City"

June 20 JR-34-78
4:00 - 5:00 PM.

Town of Shell Beach, CA (southern part of
Town) Public Beach with
turning down cliff face -
L. scutellata & L. clarksoni on
rocks at low tide - many
(please cooperate)
Kodachrome #5, exp 8, 9 of
Shell Beach beach

June 21, 1978 JR-35-78
10:00 AM

El Capitan Beach State Park, about 15 mi NW Eureka
in spray zone + upper
intertidal. Tide just below high
water. Shells of L. scutellata
collected full of eggs
10, 11, 12? - surfing beach

June 21, 1978

JR - 36-78

12:00 Noon -

Carpinteria, CA State Beach -
Southern End of Beach - 2 plants
+ h. scutellaria from rocky outcrop;
felling tide.

Kobach, Rell # 13, 14 2nd
of Union Collection + of oil tar on
rocks with low cap to
show size.

June 22, 1978

JR - 78

Negative Station (no collection)

No Littorina rocks

San Clemente State Park

11:45 AM #5 June 15 - 5194

+ 16 - "Horn on cliff" 10:30 AM

June 22 1978

JR - 78

San Onofre State Park

Negative Stationing collection)

11:15 AM - no rocks

June 22, 1978

JR - 37-78

12:15 PM - somewhat cloudy, 10:00 AM

Carl's, Cal. - 1500 ft

+ 1 plant - S of State Beach
at Jct of entrance to canyon.

June 22, 1978

JR-38-78

2:30 AM

West (Ocean side) of Pt. Loma
San Diego Co. (The pool
access area) on rocks above
sea level, suitable for plantings - in
spray zone, from 2 ft above ca 30'
above water on vertical cliff face
in spray zone & in pool area in
pools.

Wardlawia R²¹ 5 from 17, 18,
19, 20 & 21 & 22

June 23 at L.A. County Museum

June 24 L.A. to La Jolla
Road 5 to 21, 22 & 23
1st. Coast road rocks! in
shrubbery (123 Blue Varden)
1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - 26 - 27 - 28 - 29 - 30 - 31 - 32 - 33 - 34 - 35 - 36 - 37 - 38 - 39 - 40 - 41 - 42 - 43 - 44 - 45 - 46 - 47 - 48 - 49 - 50 - 51 - 52 - 53 - 54 - 55 - 56 - 57 - 58 - 59 - 60 - 61 - 62 - 63 - 64 - 65 - 66 - 67 - 68 - 69 - 70 - 71 - 72 - 73 - 74 - 75 - 76 - 77 - 78 - 79 - 80 - 81 - 82 - 83 - 84 - 85 - 86 - 87 - 88 - 89 - 90 - 91 - 92 - 93 - 94 - 95 - 96 - 97 - 98 - 99 - 100 - 101 - 102 - 103 - 104 - 105 - 106 - 107 - 108 - 109 - 110 - 111 - 112 - 113 - 114 - 115 - 116 - 117 - 118 - 119 - 120 - 121 - 122 - 123 - 124 - 125 - 126 - 127 - 128 - 129 - 130 - 131 - 132 - 133 - 134 - 135 - 136 - 137 - 138 - 139 - 140 - 141 - 142 - 143 - 144 - 145 - 146 - 147 - 148 - 149 - 150 - 151 - 152 - 153 - 154 - 155 - 156 - 157 - 158 - 159 - 160 - 161 - 162 - 163 - 164 - 165 - 166 - 167 - 168 - 169 - 170 - 171 - 172 - 173 - 174 - 175 - 176 - 177 - 178 - 179 - 180 - 181 - 182 - 183 - 184 - 185 - 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854 - 855 - 856 - 857 - 858 - 859 - 860 - 861 - 862 - 863 - 864 - 865 - 866 - 867 - 868 - 869 - 870 - 871 - 872 - 873 - 874 - 875 - 876 - 877 - 878 - 879 - 880 - 881 - 882 - 883 - 884 - 885 - 886 - 887 - 888 - 889 - 890 - 891 - 892 - 893 - 894 - 895 - 896 - 897 - 898 - 899 - 900 - 901 - 902 - 903 - 904 - 905 - 906 - 907 - 908 - 909 - 910 - 911 - 912 - 913 - 914 - 915 - 916 - 917 - 918 - 919 - 920 - 921 - 922 - 923 - 924 - 925 - 926 - 927 - 928 - 929 - 930 - 931 - 932 - 933 - 934 - 935 - 936 - 937 - 938 - 939 - 940 - 941 - 942 - 943 - 944 - 945 - 946 - 947 - 948 - 949 - 950 - 951 - 952 - 953 - 954 - 955 - 956 - 957 - 958 - 959 - 960 - 961 - 962 - 963 - 964 - 965 - 966 - 967 - 968 - 969 - 970 - 971 - 972 - 973 - 974 - 975 - 976 - 977 - 978 - 979 - 980 - 981 - 982 - 983 - 984 - 985 - 986 - 987 - 988 - 989 - 990 - 991 - 992 - 993 - 994 - 995 - 996 - 997 - 998 - 999 - 1000

June 26, 1978

JR-38-78

about 4 miles north of La Jolla
Marine Mts. Pt. II - Rocks just
above water along road. Went
& h. penicillata. (about 7:00 PM)

June 25, 1978

JK - 78

Negative Station

in front of Hotel about 2 mi
N. of La Paz, B.C.S., Mexico. rock
jet extending into La Paz Bay -
No shells seen.
Kobachian rolls - 6:35, 7:00 Hotel in La Paz
Jelly -

June 25, 1978

JK - 4078

5:30 P.M.

El Centenario, B.C.S., Mexico

jet ^{west} of station on rubble
& sand conglomerate shore - low
tide. Did shells only seen - no
fossils. On ^{south} side of
Bay

June 25, 1978

JK - 78

Negative Station - 6:30 P.M.

About 1 mi N. of El Comitan,
B.C.S., Mexico - shoreline similar
to # JK 4078. No shells seen.

1. Drive from La Paz 5-10 - La

Paz from El Centenario + El
Comitan + picture of sunset
from La Paz waterfront
checked notes in downtown La Paz, Mex.

June 26, 1978

JR-41-78

12:00 Noon → 1:30 PM

Puerto Leticia, Brazil, about
4 Km S of Todos Santos, BC S
region. Litteraria nudata (gr)
in crown of rock above tide
line. Part of south end
of beach.

Kirk's 2 items 11-17

of Litteraria

June 26, 1978

JR-42-78

San Pedro, ca 7 Km S of
Todos Santos, BC S, Mexico
4 species Litteraria in place.
The plants are growing at
edge of mangrove, sandy - rocky
in soil. A lot of L. nudata
in place. Some L. nudata
in place. Some L. nudata
in place.

Kirk's 6 items 18-21

22 - Palm grove + road
23 - Ranch House

Kodachrome 24

Punto Lobos from Highway

25 Todos Santos

from South on Highway

26 - Sign to Boqueron

27-30 along road to

La Paz from

Kodachrome 24

Cactus + Mesquite

Kodachrome 31 - 28 km out of

La Paz - Rd. San SW

Passing #1

at San Pablo

1.11.24 24 25 26 27 28 29 30 31

11.11.24 24 25 26 27 28 29 30 31

into 5.11.24 24 25 26 27 28 29 30 31

11.11.24 24 25 26 27 28 29 30 31

from a great canyon ridge

of 11.11.24 24 25 26 27 28 29 30 31

June 27, 1978

Kodachrome 32-33

- on road to Cabo San Lucas

#34 - El Triunfo from
hill just before reaching
town

#35 mountain from rd. between
San Antonio + San Bartolo

#36 mountain + canyon before

#37 San Bartolo

#38

#39

to END OF FILM -

Film #7 Kodachrome #1

view up canyon where

1.11.24 24 25 26 27 28 29 30 31

just before road reaches La

Pan de Azúcar

June 27, 1978

JR-43-78

Los Barriles - Rocks on
Sandy Beach - 1 point on
sunny side of rocks (cave) + Sighovans
+ small eggs moss on wave
platform below about 100m

Station #7 - to #8

#7 #9 -

view of mts to right of highway
of mts with clouds on top
(to left was bay) just out of
Los Barriles toward San José del Cabo

Station #10 -

The Lomas West of
San José del Cabo.

Station #11 + 12

To the E - SP 200 E2 LINE

13 + 14

beach + punta palmilla
near San José del Cabo

#15 View of Land End, Cabo

#16 View other way

San Lucas

June 27, 1978

JR-44-78

11:45 AM

Cabo San Lucas, BCS, Mexico
on rd. next to cannery factory
2 pullets, penicillata, eggs
on rocks & on crevices
2 pullets, down to paper
under, near ferry dock

Washed all 75 17-21
of today's work etc

#22 Hotel @ Horse

#23 House @ Tank on
rock

! Locked in 2nd floor house

June 27, 1978

JR-45-78

Between Cabo San Lucas & San Jose
on rd. - 1st. 2nd. 3rd. 4th
Cabo San Lucas on road
going from San Jose to Cabo
San Jose, then pullata
Washed all 24-22

June 27, 1978

Kodachrome 33 - toward San
Juan del Cabo from
highway near Cabo San
Lucas Hotel (9 mi e. C.S.L.)

Kodach. #34 view toward
San Juan del Cabo
from Highway near Highway
from Cabo San Lucas

June 29, 1978

JR-46-78

Public Beach above Pichilingue
Ferry Dock, ca 11 miles (17 km)
North of La Paz, B.C.S., Mexico.

Littorina penicillata L. ? + various
other mollusks from rocks (on +
under sea stacks along rocky
beach and north of beach - many
nests eggs in pots. Few mangroves
with *L. penicillata* on lower trunks

Salinity 32-33 ‰

8:30 am

low tide

Kodachrome Roll 7 to end

" " 8 # 1-4

June 29, 1978

JR-47-78

Sheltered bay with mangrove fringe
about 2 miles south of Pichilingue
Ferry dock. L. juvenile rays
on rocks - mangrove searched
to no avail.

Salinity 35‰

Kodachrome 8 # 5

June 29, 1978

JR. 48-78

Same as JR-39-78 12 NOON

Kodachrome 8 # 6-8

Salinity 36‰

June 29, 1978

JR-49-78

Beach next to

Ferry Dock, La Paz, at end
of Sinaloa St. Pecten shells

(clab) from fishing boats. No
Littorina seen although there is a
sea wall well inside bay & harbor.

Salinity 33‰

Kodachrome 8 # 9 V.F.V. of La Paz

From west of town - our notes in trees just
before bridge just west.

June 29, 1978

JR 50 78

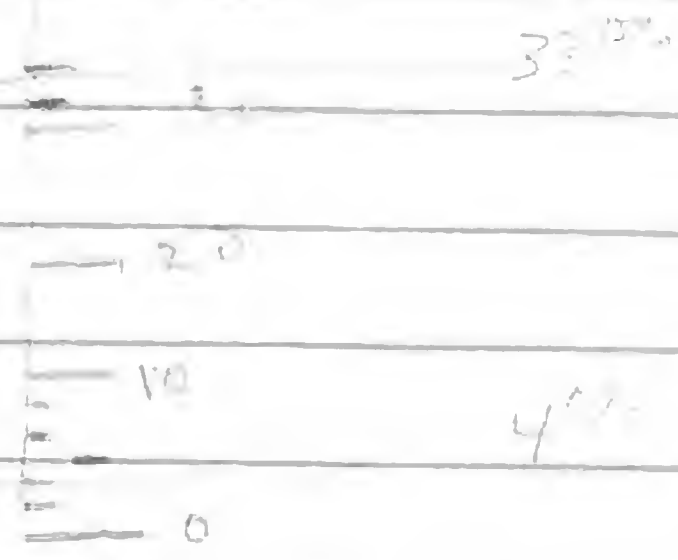
Negative Alt. - 7:30 AM

Checked gully North of Hotel
about 2 miles North of La
Paz, BCS, Mexico. No life
on rocks - apparently recently
dumped in place.

June 30, 1978

Kodachrome Roll 8 # 10-12¹ E. coast
of Baja California Sur north of
La Paz to show sandy shore
+ relief of mountains.

Finish



Adak, Aleutian Ids. see typed station list ↓

Sta JR-1-79 - June 4, 1979 - 7:40 am

Temp 10°C Salinity 4‰

Trathtic Circle Pond - at head of Sweeper Creek

Littorina (sitkaensis) - large number collected from pond polluted w/ oil & gas from oil. Sample placed in 3% formalin.

JR-2-79

June 4, 1979 8:30 am

Temp 7°C Salinity 26‰

Sample from NW side of Sweeper Creek

Littorina, Hydris + Acornia from 4 m - preserved in 5% formalin.

NOTE: Many smooth forms at #1 above at low salinity; at #2 most litt. were more uniformly spirally furrowed. (Salinity effect?)

Adak

JR-3-79

June 5, 1979

Temp 7°C

Salinity 29‰ 8-10 AM

Along Seawall - just outside of
Swamp Cove - Littorina, Borealis,
Murex, Littorina, Littorina, Littorina from
rocks and algae.

JR-4-19

June 5, 1979

Temp 10°C

Salinity 0‰ 1:30-4 PM

North side, S.W. corner of Jaws Bay
rocks, seaweed, gravel. Littorina, Borealis
(mostly small) Littorina, Mya shell seen
(mostly small).

Site (common) spawning in Littorina
rocks - as many as two dozen
females (?) producing eggs
several under rocks. Females
very variable - white, dark, mottled,
spotted, etc. etc. Specimens +
photographs taken.

JR-5-79

June 6, 1979

Temp 5°C

Salinity 28.90

8-10:30 AM

sandy beach (strand) and rocky coast
to north of Naval Facility Bldg. - west
shore of Kulu Bay.

Littorina olivacea from barnacle + algae
covered rocks. ~~*Littorina*~~ (?) from
base of stone, rocks

JR-5-80

June 7, 1979

Temp 5°C

Salinity 37.0 8:15 AM

W. side of beach at point of
beach. *Littorina* from
rocks. *Littorina* from
rocks.

SR-7-79

June 7
9-10:30 AM

Fraser River stream flowing into
Delta. High water. Above
stream, the water is full
along road. Small plants are
stuck in holes at river. Fishes
fly larvae in same situation.

JR-8-79

June 7, 1979

8°C

S.E. side of road, 100 yds. from
stream. 17 birds, mostly 1st
stage at 1st river. 2nd stage
noted 1 in water, and
laying eggs (6th)

(mass spawning)
increase in large egg mass water
level

JR-9-79

June 8, 1979

12°C

0% visibility 9:30-10 AM

Went down river at delta
+ low water site (Hudson body
above 1st stage water from
trough, 1st stage, low water
site, etc.)

JR-10-79

June 8, 1979

22°C 10:30-12

South side of river, 100 yds
inside in sand pit - rock
work

JR-11-79

June 8, 1979

Same as JR-5-79 - Jellyfish
& Clam shells at a lot on beach.
Clam shells from the beach
in the water.

JR-12-79

June 9, 1979

11-1-79

For 100 ft. Clam shells on
sand - lots - clear large, small, etc.
and many small. etc. dug from sand.
& Long Turfite.

JR-13-79

June 10, 1979

3-2

2970 feet

North end of the

Bay - Bay port at 7 feet

granite and
I think in the sand in the (sample
of the sand in the red layer) X

1. The sand in the red layer is
the same as the sand in the red layer.

Beach in the sand in the red layer
is a sandy layer - lysate.

JR-14-79

June 10, 1979

1st spring down at N end of
the (sample of the sand) Bay - Insects
from the sand in warm water
1010°F

JR-15-79

11 June 1979

9-11 AM

Base of mt. Muff/ctf. w.
of Adair Neck. Sea from
pool of mountain stream. Slugs
crawling on thick vegetation.

JR-16-79

13 June 1979

14°C

16% humidity

ca 3-4 PM

Afterglow - from rocky at
either end of vegetation body
connecting Japanese and Japanese
Islands. Tide rising - Littorina
patches planted above water
level; the patches at and below
water level. Two large, long,
dark patches - a small stream
on rock.



see typed field station list

Odiorne Point State Park
Roughingham, Rye N.H.
JR-17-79

28 June 1979

15°C 28% humidity

7:30-9:00 PM

Odiorne State Park, US Rt. 1-A -
just south of Portsmouth, N.H.

Littorina (3 species) Nucella

Armonia

other at

low

isobryus

1

2

3

4

5

6

6a

July 1979

30-12:00 AM

large

large

large

large

large

large

1

2

3

4

5

6

6a

Varshall

ohen

ollette

Jardner

Wilson

~~West~~

JR-15-79

11 June 1979

9-11 AM

Base of mt. Muffett w. side
of Adams Pond. Low tide from
pool of mountain stream, slug
crawling on thick vegetation.

JR-16-79

13 June 1979

14°C

16% humidity

ca 3-4 PM

Littorina claps - from rocks at
either end of narrow bridge
(connecting Japanese and Japanese
Islands). Tide rising - *Littorina*
introduced above water
level, the *Littorina* at and below
water level. No *Littorina* living
below water level - a record of *Littorina*
on rocks.



see typed field notes list

Odiorne Point State Park
Rockingham Co., Rye N.H.
JR-17-79

28 June 1979

15°C 28% humidity

7:30-9:00 AM

Odiorne State Park, US Rt. 1-A -
just south of Portsmouth, N.H.
Littorina (3 species) *Nucella*
acuminata, etc from rocks at
low tide. (*Littorina* for *isolepis*
only)

JR 18

Portsmouth

8 July 1979

" 14% humidity

11:30-12:00 PM

Littorina + *Nucella* - *Littorina*
at low tide. *Littorina* at low tide.
Littorina at low tide. *Littorina* at low tide.
Littorina at low tide. *Littorina* at low tide.
Littorina at low tide. *Littorina* at low tide.

Nov. 14-20 Bermuda
(14th Travel 20th Travel)

JR-19-79

15 Nov 1979

Tobacco Bay, Northeast end
St. Georges Island, Bermuda

10:30 - 12:30 Chitons, Mytilids, misc
smaller, from rocks at and
below low tide line.

JR-20-79

15 Nov, 1979

Ferry Reach, South side St. Georges Id.,
Bermuda, 8:00 - 8:30 P.M. sweep net in algae
& sand - 2-3' - at Bermuda Biological Station.

JR-21-79

16 Nov 1979

Hungry Bay, south side
Bermuda Island, Bermuda

10:30 - 2:00 P.M. Chitons,
Mytilids, Littorinids, from intertidal
rocks and mangroves.

(JR-21a-79, chitons collected outside
of Bay on open coast - for
d. Hendricks)

Brachidontes domingensis Lam, 1819
Chiton tuberculatus Linne, 1758.

JK-22-79

16 Nov 1979

Gravelley Bay, south side Bermuda
Island, Bermuda 11-1 P.M.
Littorinids + Neritids from
intertidal rocks. D. Pawson!

JK-23-79

16 Nov. 1979

Grounds of Bermuda Biological
Station, southwest shore of St.
George Island, Bermuda. Land
snails from leaf litter (also
eggs of Macrochilista) 9:00 P.M.
+ miscellaneous sawbugs, spiders, centipedes

JK-24-79

17 Nov, 1979

Coney Island, northeast tip
Bermuda Island, Bermuda (small
bay at N. end of island) 11:00 - 1:00 P.M.
Miscellaneous mollusks from intertidal rocks.
(In association of erycinid and Brachidontes)

JR-25-79

18 Nov 1979

Flatts Inlet, Harrington Sound,
North side Bermuda Island,
Bermuda. from intertidal rocks
just inside causeway at entrance to
sound. 12 - 2:00 P.M.

JR-26-79

18 Nov. 1979

Bermuda Biological Station Ferry Reach,
south shore of St. George's Is., Bermuda
- formation wash of algae - some
minute mollusks present.

[+ additional mollusks to come from
dredging made 19 Nov. 1979 with
M.L. Jones]
↓

JR-1-80

12 May 1980

Ferry Point - South Side

Inlet across from Whalebone
Bay, St. George's, Bermuda

2:00 P.M. grass flat, mangrove
Bittium Littorina, etc.

JR-2-80

12 May 1980

Ferry Point - tip of Point +
inside under rocks + on rocks
Chiton, Columbella etc.

JR-3-80

13 May 1980

Natural Caves, Tankers Town,

15:00 P.M. - Bermuda - Ocean side
Littorina, Tritonia + Nodilittorina
on rocks.

JR-4-80

13 May 1980

1:00 P.M. Hungry Bay, Bermuda

Littorina + Chiton for metal
study

JR-5-80

14 May 1980

Tobago Bay, Bermuda -
7:30 - 11:30 AM. for tests
Falling tide, Anthus + Hain +
chitons.

JR-6-80

14 May 1980

1:00 PM - 4:00 PM

Coney Is. Bay, Bermuda
Low tide. Sand, weed, rocks

JR-6-80

margin of Coney Is. Bay
Low tide on mudflat (with
litter).

JK-7-80

10 Sept 1980

1100-1200 AM

Mosses at Roosevelt Inlet on rocks
at fishing boat Breakwater Harbor,
New's Delaware, falling tide.
Littorina littorea and L. saxatilis
on rocks near breakwater barrier
among barnacles (Salinity 32-33
ppt)

JK-8-80

10 Sept 1980

1:30-3:30 PM

North shore Indian River Inlet,
about 7.3 miles south of Rehoboth
Beach, Delaware; on rocks flanking
outside of inlet promontory;
Littorina littorea and L. saxatilis
in upper barnacle zone the former
rather rare and small, the latter
common, nestled among barnacles
(very variable coloring).

#5 Playa Larga - Bahia Cardenas

Littorina nebulosa plentiful, but with
oil pollution - 1 collection

#6 Playa Larga - Bahia Cardenas
on boat off shore of Playa
L. nebulosa

#7 East of Bahia de Cardenas -
in Rice Paddy - Littorina nebulosa
L. nebulosa & Playa abundant
- water only - few birds here.

#8 Playa La Loma - Condensed
shells in drift (Tegula discolor)
+ collected all along beach from
many years ago - some shells in
Littorina nebulosa used to be there
- but only 6 specimens found +
L. nebulosa abundant.

#9 +

14 Nov. 1980

Acacia de Vazquez

Zona de Chapulin. Many lat. angust
and somewhat mottled. Creek to Chapulin.
More than 50 specimens collected. Also
1. white, 2. yellow, 3. brown, 4. black
eggs of the same species as Chamaeleo

#10 Puerto Molino on El Estero
Chamaeleo (near #7) collected Chamaeleo

#11 Playa de la Loma, Cardenas
L. nebulosa (very large) many birds here
- water only - few birds here
Littorina nebulosa

#12 Puerto Loma (a beach + mangrove
area) L. nebulosa (very large) many
birds here - water only - few birds here
Littorina nebulosa + Chamaeleo

#13 Puerto de la Loma, Cardenas
L. nebulosa (very large) many birds here
- water only - few birds here
Littorina nebulosa + Chamaeleo

14 Nov 1961

Station - 156 hrs. 12 June 20, 1964
T. 1000-1000 - bottom, sandy, brown
P. nodulosa, 2-3 ft. high, 10-15 ft. wide
1. 1000-1000 - 1000 - 1000, all
2. 1000-1000 - 1000 - 1000, all
high tide.

Sta #15. macho
 1st half of the ...
 2nd half of the ...
 3rd half of the ...
 4th half of the ...
 5th half of the ...
 6th half of the ...
 7th half of the ...
 8th half of the ...
 9th half of the ...
 10th half of the ...

Longport City

to Haysville, Giesra Del Medina.
 1 mile on road in water boat and
 1 mile on road, 2 miles
 on road, 1 mile on road - in morning
 2 miles on road, 1 mile on road. Took boat out
 to Haysville, Giesra Del Medina.

Playa Cijio near Güira Pil Melane

Nov 15

City of Portland (on the S. of City)
S. 100 ft. by 100 ft. by 100 ft.
100 ft. by 100 ft. by 100 ft. (yellow)
100 ft. by 100 ft. by 100 ft.
100 ft. by 100 ft. by 100 ft.

Nov 15

[illegible]

San Francisco de Paula, Havana
16 Nov 1951

Stn 19 on road of house & museum
of Santa Clara - collected
a few birds - all *Chondestes*,
Coccyzus, *Myiarchus cinerascens*,
Myiarchus cinerascens, *Myiarchus cinerascens*,
brought to Havana by George 120
years ago. ^{at} *Myiarchus cinerascens*
+ *Myiarchus cinerascens* + *Myiarchus cinerascens*

Stn 20 Capitan Little fishing
port - collected *Myiarchus cinerascens*
old man 1 to 10 - collected from the
N. to S. side of the road.
Slightly, a few on sea wall.
Then on ridge, sea wall, *Myiarchus cinerascens*
Collected *Myiarchus cinerascens* on a
rock from the sea - *Myiarchus cinerascens*
the *Myiarchus cinerascens*.

SAUNDERS & WEHMAN 1977

SAUNDERS & WEHMAN 1977

Logy Bay
N. of St. John's,
Nfld.

21 July 79

Site of Marine
Scientific Research
Lab. MUN.

CFER

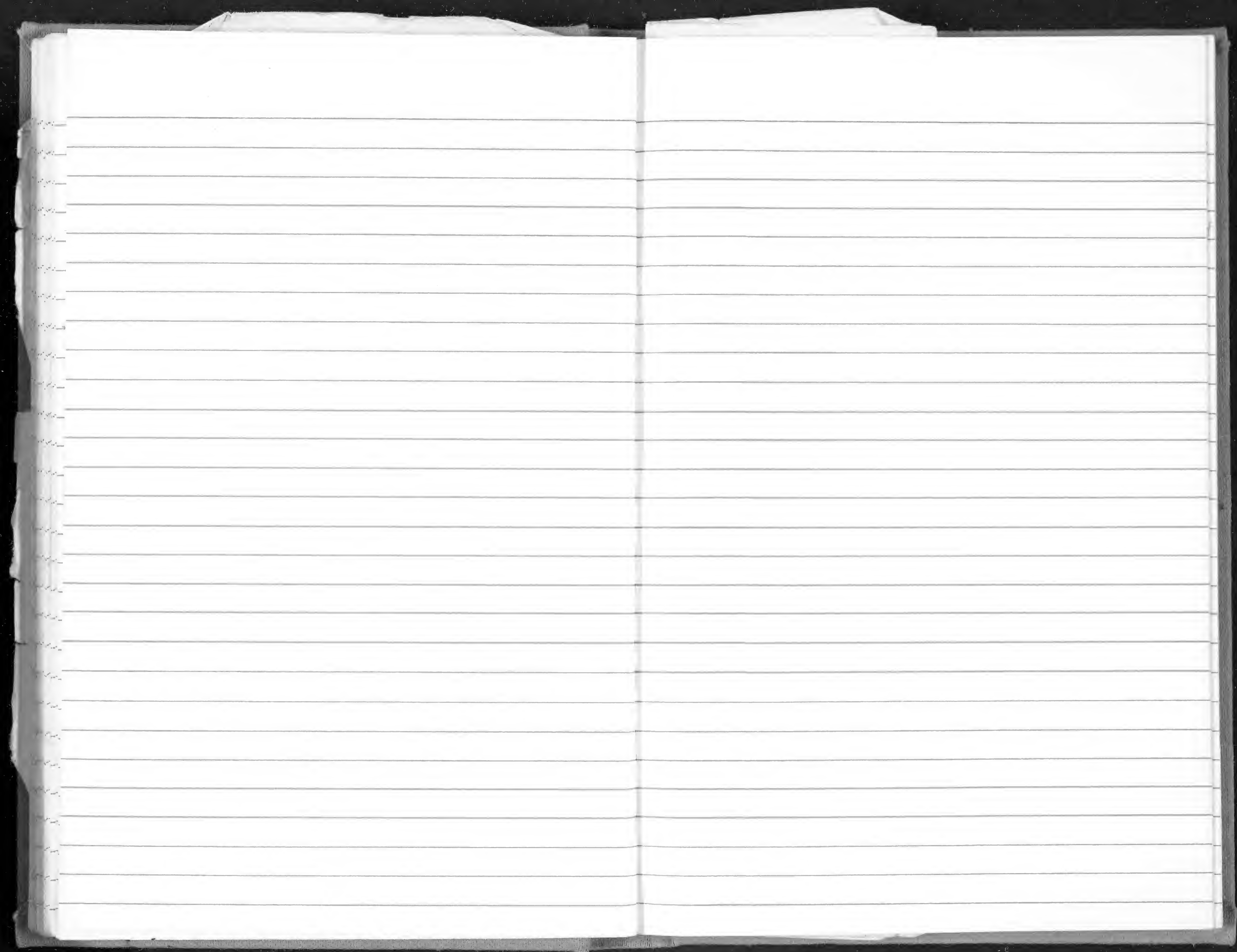
rec'd 81/179
into ^{sup} H2O @
10:00 AM

100 into Tris
+ Balance frozen 2 Aug
179

San Francisco to Santa Monica
11. Nov 1951

Start 19 in creek of house & museum
of Robert H. Wherry - collected
a few land shells: *Chondropoma*,
Gongylodonta, *Strophomena*, *Leptodonta*,
Strophomena, *Strophomena*, *Strophomena*,
traced to house by George 125
years ago. (Perry) *Strophomena*
+ *Strophomena* + *Strophomena* + *Strophomena*

Start 20 Cajon (little fishing
port with museum) - collected *Strophomena*
"Old man" - collected *Strophomena*
N. to S. - *Strophomena*, *Strophomena*,
Strophomena, *Strophomena* on sea wall.
Then on *Strophomena* in creek. Found
colony of *Strophomena* on a
rock below the *Strophomena* - *Strophomena*
then *Strophomena*.



Isoenzyme - Adak
into buffer/June 6, 1979

L. Hovina at Kona⁺ Station JP-1-79

- 1-1 dark gray, smooth
1-2 * light gray fine brown stripe, smooth +
1-3 med. gray, closely brown wide stripe, smooth
1-4 medium brown, weak sculpture ^{if br.} stripes on sublt
1-5 dark brown, moderate sculpture
1-6 dark brown, weak sculpture, faint brown stripe
1-7 yellowish gray, smooth. veiled ^{dark} gray stripes
1-8 brown, moderate sculpture
1-9 brown, h. st. st. sculpture
1-10 th. ⁺ dark gray + lt. gray stripe, smooth
1-11 * light yellowish gray, fine br. stripe, smooth *
1-12 greenish brown, dk br. stripe, sculpture
1-13 yellowish brown, sculpture
1-14 dark brown, weak sculpture
1-15 dk greenish brown strong sculpture
1-16 dk greenish br., weak sculpture
1-17 medium brown, moderate " "
1-18 dk br. gr., smooth " "
1-19 red br. " " "
1-20 br. " " " "
1-21 dk br. " " " "
1-22 dk br. " " " "
1-23 dk br. " " " "
1-24 dk br. " " " "
1-25 dk br. " " " "
1-26 dk br. " " " "
1-27 dk br. " " " "
1-28 dk br. " " " "
1-29 dk br. " " " "
1-30 dk br. " " " "
1-31 dk br. " " " "
1-32 dk br. " " " "
1-33 dk br. " " " "
1-34 dk br. " " " "
1-35 dk br. " " " "
1-36 dk br. " " " "
1-37 dk br. " " " "
1-38 dk br. " " " "
1-39 dk br. " " " "
1-40 dk br. " " " "
1-41 dk br. " " " "
1-42 dk br. " " " "
1-43 dk br. " " " "
1-44 dk br. " " " "
1-45 dk br. " " " "
1-46 dk br. " " " "
1-47 dk br. " " " "
1-48 dk br. " " " "
1-49 dk br. " " " "
1-50 dk br. " " " "

1-26 Green grey weak sculpture
 1-26 " " - moderate
 1-30 dk " - very weak
 1-31 grey white, blotchy - weak
 1-32 dk grey " "
 1-33 " " moderate sculpture
 1-34 " " weak to moderate
 1-35 " " " - sculpture
 1-36 red brown, weak
 1-37 dk green, smooth
 1-38 * dk grey yellow, no stripes - smooth *
 1-39 dk green weak sculpture
 1-40 dk greenish brown, weak sculpture
 1-41 dk br, mod sculpture
 1-42 dk yel green weak sculpt
 1-43 br green mod sculpture
 1-44 dk br violet stripes, weak
 1-45 dk " " "
 1-46 " " "
 1-47 " " "
 1-48 dk grey, viol. spots
 1-49 * yellowish grey, no stripes - smooth *
 1-50 dk grey, mod sculpture
 1-51 dk brown, smooth
 1-52 dk grey - weak sculpture
 1-53 dk green, smooth
 1-54 " " weak sculpture
 1-55 " " "

1-56 * yel green - fine b. str, smooth *
 1-57 * yel " - no stripes - " *
 1-58 dk br, violet str - very weak sculpt
 1-59 yel, green " " "
 1-60 dk greenish br, mod. sculpt
 1-61 red brown, fine sp - smooth
 1-62 brown, violet str, nearly smooth
 1-63 dk br violet " weak sculpture
 1-64 " " " smooth
 1-65 " " " "
 1-66 " " " "
 1-67 yel br, mod str
 1-68 " " weak sculpture
 1-69 dk grey " " smooth
 1-70 " " " " smooth
 1-71 brown " weak sculpture
 1-72 dk brown " nearly smooth
 1-73 dk greenish brown weak sculpture
 1-74 brown violet stripes " "
 1-75 " " " smooth
 1-76 dk greenish brown nearly smooth
 1-77 " " " " "
 1-78 " " " " "
 1-79 " " " mod. sculpture
 1-80 " " " weak sculpture
 1-81 " " " "
 1-82 " " " "
 1-83 " " " smooth

1-84	dk	rich brown	moderate
1-85	"	"	moderate
1-86	"	grey	moderate
1-87	"	grey	moderate
1-88	"	grey	moderate
1-89	"	grey	moderate
1-90	"	grey	moderate
1-91	"	grey	moderate
1-92	"	grey	moderate
1-93	"	grey	moderate
1-94	"	grey	moderate
1-95	"	grey	moderate
1-96	"	grey	moderate
1-97	"	grey	moderate
1-98	"	grey	moderate
1-99	"	grey	moderate
1-100	"	grey	moderate

X

[idea that these forms are not of
disruptive selection - that the various forms
are interspecific interbreed and maintain
a common gene pool.]

Isoenzyme - Adak

into Butter June 7, 1979

Lithomiae at Kanet

Station JR-4-79

4-1	red grey, mottled stage, nearly smooth
4-2	yellow grey, broad dk stage, mod sculpture
4-3	yellow grey, moderate stage, weak sculpture
4-4	dark br grey, white stage, smooth
4-5	greenish grey, mottled stage, nearly smooth
4-6	yellow grey, moderate sculpture
4-7	dark grey, mottled stage, weak sculpture
4-8	yellow green, mottled stage, moderate sculpture
4-9	broad dk brown, white stage, smooth (Hypocistis)
4-10	brown, mottled stage, moderate sculpture
4-11	grey, white to moderate sculpture
4-12	broad dk greenish brown, pale yellow, white stage, mod sculpt
4-13	mottled, dk brown, pale yellow, white, mod sculpt
4-14	red grey, green, smooth
4-15	mottled grey, white, moderate sculpt
4-16	green-grey, fine stage (mottled), weak sculpt
4-17	" " " " " "
4-18	" " " " " "
4-19	broad dark brown, narrow white stage, mod sculpture
4-20	" " " " " "
4-21	lt grey, dark grey at base, weak sculpture
4-22	red grey, smooth
4-23	" " mottled stage, brown shades, smooth
4-24	" " " " " " weak sculpture
4-25	red brown, brown stage, no spiral sculpture, strong
4-26	mottled green, grey, mod sculpture
4-27	dk grey green, mottled stage, mod sculpture

4-28 Lt grey, faintly mottled, strong sculpt^{ure} / mod
 4-29 ~~Yellowish brown~~, orange lip, strong sculpt^{ure},
 4-30 * brick red. - smooth
 4-31 * yellow - smooth
 4-32 green brown, weak sculpt^{ure}
 4-33 " " smooth
 4-34 mod yellow, mottled stripe, mod sculpt^{ure}
 4-35 mid grey " " " " " "
 4-36 grey-green " " " " " "
 4-37 brownish green, br stripe as in 4-36, heavy sculpt^{ure}
 4-38 grey-green mottled stripe, weak sculpt^{ure}
 4-39 " white stripe at shoulder & base, mod sculpt^{ure}
 4-40 grey-yellow, weak sculpt^{ure}
 4-41 mottled lt grey-brown, weak sculpt^{ure}
 4-42 the same as 4-41, mottled stripe, weak sculpt^{ure}
 4-43 (X) dk br. green, strong sculpt^{ure}
 4-44 * orange-yellow smooth
 4-45 * dark orange brown fine stripe smooth
 4-46 dark brown heavy sculpt^{ure}
 4-47 yellow grey, mottled stripe smooth
 4-48 Smooth Nereida
 4-49 blotchy brown smooth
 4-50 blotchy brown - smooth
 4-51 greyish yellow & grey stripe - smooth
 4-52 Smooth Nereida
 4-53 blotchy brown & grey - mod sculpt^{ure}
 4-54 dk brown grey - mod sculpt^{ure}
 4-55 reddish grey - mod sculpt^{ure}

4-56 orange grey - mod sculpt^{ure}
 4-57 whitish grey - mod sculpt^{ure}
 4-58 yel green " "
 4-59 dk grey - weak sculpt^{ure}
 4-60 " greenish grey - weak sculpt^{ure}
 4-61 " " " mod "
 4-62 yel grey & fine brown on sculpt^{ure} - mod sculpt^{ure}
 4-63 dk blotchy br - weak sculpt^{ure}
 4-64 dk green - wild stripe - smooth
 4-65 dk grey - mod sculpt^{ure}
 4-66 mottled lt grey - mod sculpt^{ure}
 4-67 dk brown - mottled stripe - weak sculpt^{ure}
 4-68 mottled dk grey - weak sculpt^{ure}
 4-69 greyish yellow - mod sculpt^{ure}
 4-70 mottled lt / dk grey - weak sculpt^{ure}
 4-71 (redaceous slightly) brownish / yel green smooth
 4-72 dk green & lighter stripe at shoulder & base / mod sculpt^{ure}
 4-73 dk brown - mod sculpt^{ure}
 4-74 mottled lt grey - weak sculpt^{ure}
 4-75 dk red / brown heavy sculpt^{ure}
 4-76 dk green - mod sculpt^{ure}
 4-77 " weak "
 4-78 brown - mod "
 4-79 dk grey & mottled stripe - smooth
 4-80 1/2 brown & grey / mod sculpt^{ure}
 4-81 dark brown / white dark stripe - smooth
 4-82 dk yellow grey - weak sculpt^{ure}
 4-83 dk green weak sculpt^{ure}

4-84 grey/white (dk spine) weak sculpture
 4-85 red/purple/mottled stripes " "
 4-86 dk brown - smooth sculpture
 4-87 dk greenish brown - heavy sculpture
 4-88 red/brown - weak " "
 4-89 grey/green - mottled stripes weak sculpture
 4-90 dk " " " weak " "
 4-91 blotchy brown/grey - weak sculpture
 4-92 dk green/brown " "
 4-93 " green weak " "
 4-94 mottled grey " " "
 4-95 blotchy brown " "
 4-96 dk green/mottled stripes " "
 4-97 grey with dk spots below sculpture strong and
 4-98 " " " " " " "
 4-99 " " " " " " "
 4-100 dk brown - smooth —

h. albicollis

JR-5-79

8 June 79

5-1 Dark Brown
 5-2 "
 5-3 "
 5-4 "
 5-5 "
 5-6 "
 5-7 "
 5-8 "
 5-9 "
 5-10 "
 5-11 "
 5-12 "
 5-13 "
 5-14 "
 5-15 "
 5-16 mottled red/grey/brown - blotchy
 5-17 "
 5-18 "
 5-19 "
 5-20 "
 5-21 "
 5-22 "
 5-23 "
 5-24 "
 5-25 rather grey/brown
 5-26 "
 5-27 "

5-28

5-29

5-30

5-31

5-32

5-33

5-34

5-35

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5-80

5-81

5-82

5-83

5-84

Gray with brown stripe (fine)

S-85

S-86

S-87

S-88

S-89

S-90

S-91

S-92

S-93

S-94

S-95

S-96

S-97

S-98

S-99

S-100

site hana

dark heavily
mottled

12/14 @

with ice -

Date

Sta No

Time

Locality

Ecology

Bottom

Top shore

Water Temp

Salinity

Tide

Depth

Photograph

General Comments

- South Cove, Cape Arago, nr Charleston
- Cape Arago lighthouse, nr Cook Bay
- South fletcher near Charleston (inside)

S-85

S-86

S-87

S-88

S-89

S-90

S-91

S-92

S-93

S-94

S-95

S-96

S-97

S-98

S-99

S-100

SR-16-79 L. Sitchana

in Tris

16-1-100 - dark heavily
sculptured phenotype

put in containers 12/14 @

9-10 AM with ice -

JR-17-79 L. l. Hovea
17-1-50-L (into Tris +
frozen 7/4/79)

JR-17-79 h. obtusata
17-1-50-0 (into Tris +
frozen 7/4/79)

1. striped - "like littorea"

2. "

3. "

4. yellowish green

5. "

6. "

7. "

8. "

9. "

10. "

11-25 - dark brown, very low spire

26-50 Olive green - "typical"

(H4" are dark more like 11-25)

JR-17-79 h. saxatilis
17-1-100-S into tris +
frozen 7/3/79

1-25 Grey-white typical saxatilis

26-34 Grey-brown, smaller, heavy sculpture
- white band into aperture, purple spot
on columella

35-51 dark brown - tuberculate, sculptured, dark aperture

52-59 Orange color - not heavily sculptured

60-66 Blended

67-72 Slab brown (dull) larger, sculpture

smoothish, not heavily sculptured

("saxatilis?")

JR-18-79 - h. arriati
18-1-59-i into tris +
frozen 7/9/79

(CR)-19-19

Log Bay Water 1/10

N 510

July 19

19-1-17

East

19-18-47

60

19-48-65

Thick - water level

19-66-71

East

19-2

East

19-23-100

Water

(note - 100 ft - 100 ft)

JR-1-81

May 15, 1981

4:00 - 5:00 PM

Northeastern University Marine
Laboratory, Nahant, Massachusetts -
from large granitic boulders at low
tide - in crevices and associated with
barnacles, Littorina saxatilis +

collectors: Linda Haas, Ruth Turner,
J. Rosewater!

* was given 2 other lots by
M. P. Morse collected at Eastport, Maine
in May 1981

one from Dog Island + another from
Crows Neck

JR-2-81 August 21, 1981

3:00-3:30 P.M.

Beal Island, off Jonesport,
Maine - rocks on shore. High tide.
No mollusks found, Negative Station

JR-3-81 August 21, 1981

6:00-6:30 P.M.

west shore of Passamaquoddy Bay.

Redcliff Motel, about 12 miles south
of Calais, Maine - rocks along
base of cliff, seaweed *Littorina*
saxatilis higher + *L. littorea* on
wet rocks uncovered by falling tide

Salinity

Temperature

Note: *L. saxatilis* not on high shore
rocks here but lower on wet rocks
being uncovered as tide drops. Is
this because of greater tidal range
here?

Photos taken 21/ - Thru #6-4

JR-4-81 Aug. 22, 1981 7:30-8 AM

Same as JR-3-81 $\frac{8}{10}$ low tide

11 Aug. 38" L, 50" H, 26" W

JR-5-81 Aug. 22, 1981 9:30-10 AM

Pocologan, just E of

Low tide - gradual sloping

thru, rocks, with a 2' bottom,

with a 2' top, (see 1st)

Depth 11" to 12" - probably same 7'

1. first run

Pocologan 11" to 12"

JR-6-51 Aug 22, 1981 5:30 PM

Tidal Basin, Truro
negative station
shallow water, very muddy
bottom of bay

JR-7-51 Aug 23, 1981 9:30-1:30 PM

Salinity 31.0‰ Temp 15.4°C
5 Islands Provincial Park, N.S.

low tide, exposed areas of
sand and rock flat, sand dunes
in background, Petrie Bay
to the west, very good visibility

JR-8-51 Aug 24, 1981 9:00-9:30 AM

Salinity 31.0‰ Temp 15.4°C
5 Islands Provincial Park, N.S.
low tide, exposed areas of
sand and rock flat, sand dunes
in background, Petrie Bay
to the west, very good visibility

Salinity 31.0‰ Temp 15.4°C
5 Islands Provincial Park, N.S.

low tide, exposed areas of
sand and rock flat, sand dunes
in background, Petrie Bay
to the west, very good visibility

JR-10-81 11: - 12 PM 25 Aug 1981

Prime Point, Bayview N.S. -
NE of Digby at Gov't Lighthouse

1 sax & 1 lil from granite
boulders

JR-11-81 1:30 - 2:30 PM 25 Aug 1981

Provincial
Savory, Park, just W. of
Barton, N.S. (Pecunia ova)

Rocky shore, low tide 2:50 PM.

L. lil, obtuse, sax, Thais
- no lg boulders - few rapetula sp. etc.
Identify 3200
on 2 lg ova.

JR-12-81 3-4 PM Aug 25, 1981

Port Maitland, N. of Yarmouth
N.S. (Pecunia ova) 10:00 AM
1 sax

JR-13-81 10:30-11:00 AM 26 Aug 1981

"Sand Beach" just S. of
Yarmouth, N.S.

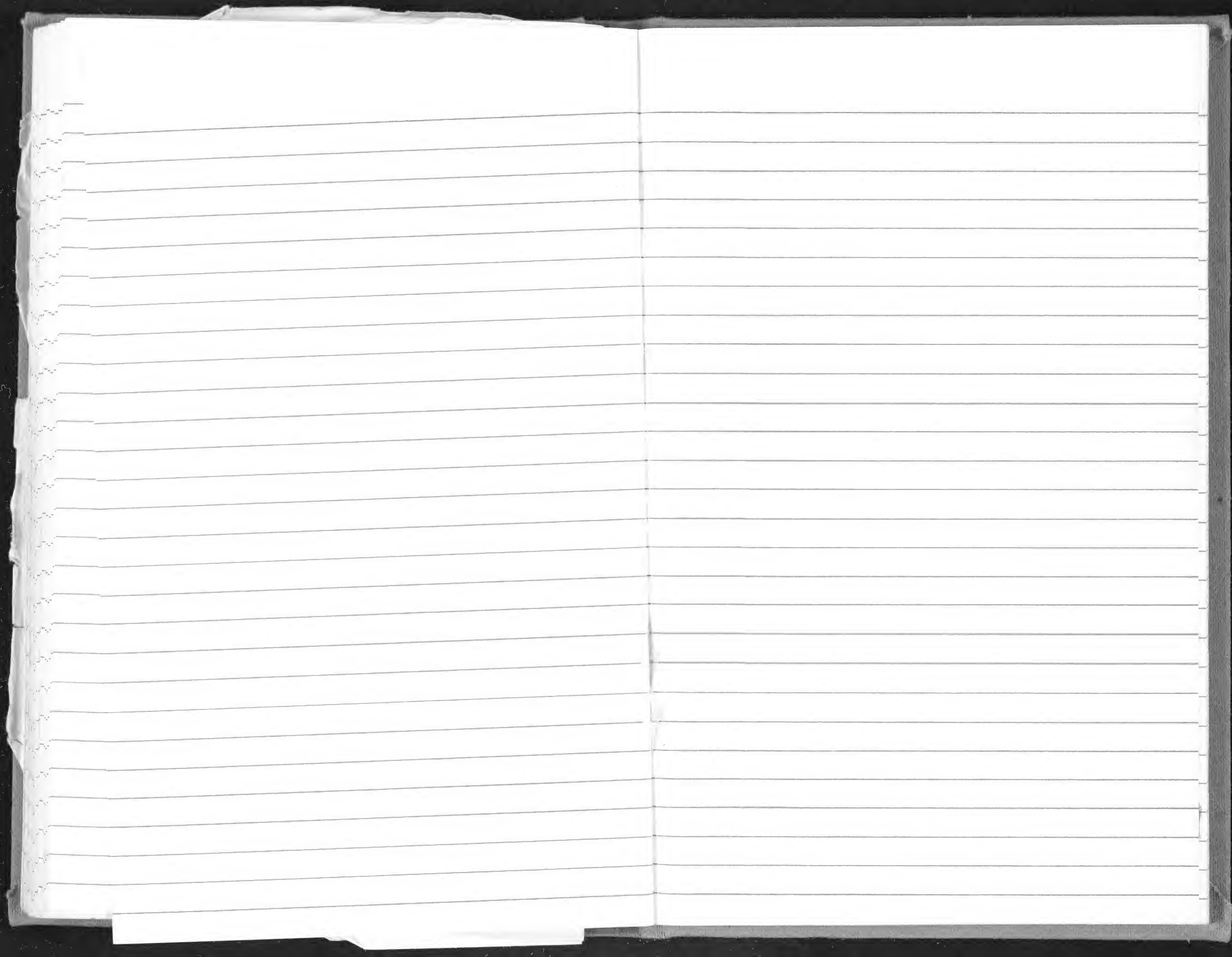
2 ft. of sand on
beach at low tide
sand lower than usual

Wait for Ferry from Yarmouth to ~~Ben~~
Hants

JR-14-81 2:30-4:00 PM 27 Aug 1981

Moose Point Fish Park, between
Leavesport (just S.W.) & Pulpit, N.S.
Low tide at 1350 - Tidal flat
exposed on rocks & mud. S. of path
only under rocks at high tide line -
shore does not have many large
boulders. High sea water rising
for hours for this dist. Low

Salinity 26.9‰



JK-15-81 4:50-5:00 PM Aug 27, 1981

Camden Hills H. Park, near
Camden, Maine - rocky
shore & cliffs. *L. sapidula*
& *Littorina* near highest
joint above sea level in
crack.

JK-16-81 2:30-4:00 PM Aug 28, 1981

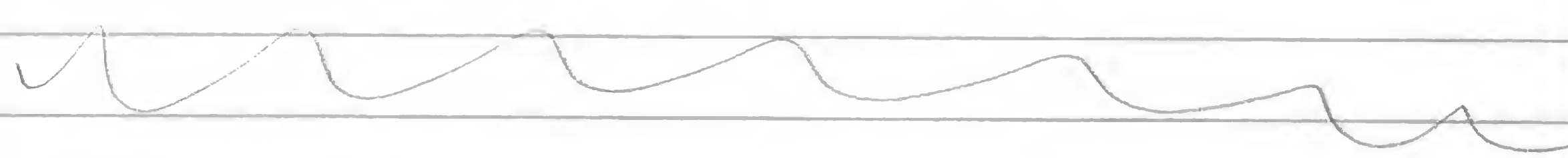
Sea Point, Kittery, Maine -
L. Littorina & *L. sapidula* - these on
rocks during low tide. (low
tide at 16:58). Note: *L. sapidula*
found with large spines, whitish
on highest rocks - but smoother
but rougher than all other
rocks at tide line of seaward
side of low on Tide - beyond

salinity 34.700

JR-17-81 5-6:00 PM Aug 29, 1981

Nahant, Mass - at MSI, NE. U.
Littorina from Palmer - neglected?
in vial 1 + L. littorea + Thais

Barometer 32.700 Temperature 68°



JR-18-81

Nov. 14, 1981

Mamala Bay, Oahu

29-35 FATH Sand + Pinnā

21° 17.4' N, 157° 54.9' W

Burch Sta 81085

Dredging - JANTHINA VII.

J. M. Rosewater, W. Thorson, T. Burch

JR-19-81

Nov. 14, 1981

Mamala Bay, Oahu

18-23 FATH SAND + Pinnā

21° 17.5' N, 157° 55' W.

Burch Sta 81086

Dredging JANTHINA VII

J. M. Rosewater

W. Thorson

T. Burch

JR-20-81

Nov. 14, 1981

Mamala Bay, Oahu, Hawaii

21° 16.7' N. 157° 54.0' W

90-120 FATH SAND

Burch Sta. 81087

Dredging - JATHINA VII

J+M Rosewater, W. Thorson, T Burch,

JR-21-81

Nov 18, 1981

Kaena Point State Park

N.W. Oahu, Hawaii

at end of paved road

shell sand from drift line

J+M Rosewater, E.A. Kay

J.R-22-81

Nov. 18, 1981

Beach, Nanai Kapono School

Nothing kept rubble Nana Kuli, W. Oahu, Hawaii

Beach rubble shell sand from drift line

H+J. Rosewater, E.A. Kay

J.R-23-81

Nov. 18, 1981

Nothing kept rubble EWA Beach, S.W. Oahu, Hawaii

Beach rubble shell sand from drift line

M+J Rosewater, E.A. Kay.

